New Jersey
Department of Environmental Protection

National Disaster Resilience Competition DRAFT Application

Public Comment Period: February 20 – March 6, 2015

The Department of Environmental Protection (DEP) is seeking public comment on its draft application in accordance with the citizen participation requirements of the HUD Notice of Funding Announcement (FR-5800-N-29). Below are the competition schedule and the substantial amendment criteria, as required by HUD.

Competition Schedule:

The National Disaster Resilience Competition is a year-long competition structured in two phases: (1) the framing phase and (2) the implementation phase.

- Phase 1 applications are due to HUD by March 27, 2015.
- HUD anticipates notifying applicants if they have been accepted in June 2015.
- If invited by HUD to participate in Phase 2, DEP will have 120 days after the date of an invitation letter to design and develop project(s).
- HUD anticipates taking up to 60 days after the Phase 2 submissions before announcing awards.
- HUD must obligate the funds (sign a grant agreement) by September 30, 2017.
- Grantees will have 24 months to expend the funds after obligation.

Substantial Amendment Criteria: The criteria for determining what changes in the Application constitute a substantial amendment requiring HUD prior approval include any change to the Application that would result in a change of more than 5 points in the score for capacity or soundness of approach or that would change the most impacted and distressed target area(s). Also, the following modifications will constitute a substantial amendment requiring HUD prior approval: a change in program benefit, beneficiaries, or eligibility criteria; the allocation or re-allocation of more than $1 million; or the addition or deletion of an activity.

Exhibit A - Executive Summary

The US Department of Housing and Urban Development's (HUD) National Disaster Resilience Competition is designed to provide federal resources to develop replicable, long-term resiliency projects to meet unmet recovery needs in the most impacted and distressed counties that suffered damage from qualifying disasters, including Superstorm Sandy. The State of New Jersey, which suffered tens of billions of dollars in damage from Superstorm Sandy, and which still has more than $17 billion in unmet needs from that disaster, including resilience needs, welcomes the opportunity to apply for this program.

New Jersey's proposed concept for this competition is to create adaptable resiliency pilot projects that incorporate layered flood risk reduction measures and can be shaped to meet local needs, conditions, and preferences in estuarine communities at considerable flood risk. Given rising sea levels and an increase in severe storms, estuarine and coastal communities must adapt. New Jersey's pilot projects will also meet the state and federal requirements for resiliency.

New Jersey's estuarine communities are particularly vulnerable to coastal and riverine flooding, both from high frequency/low intensity events (such as lunar tides and rainfall) and low frequency/high intensity events (such as hurricanes, tropical storms, and nor'easters). The risks in these communities are increased by high population densities. New Jersey is the most densely populated state in the United States (1,195 persons per square mile - 14 times the nation's average population density) and the eleventh most populous. Sixty percent of the State's population lives on or near the coast. Therefore, even disaster events with a limited geographic impact will affect tens of thousands of people.

Consequences can be especially severe for low- to moderate-income (LMI) communities and communities with vulnerable population segments. Higher flood insurance rates, the costs of

flood damage repair, and cost of compliance with new building standards for flood resilience pose particularly significant challenges. New Jersey's pilot projects therefore will be designed to provide cost-effective, adaptable options for increasing resiliency for these communities so that they can mitigate the threat of future events.

New Jersey, therefore, intends to use the funds provided through this competition to design and construct pilot projects in the Most Impacted and Distressed (MID) counties to create a model design for resiliency that will protect estuaries and estuarine communities. The State intends to apply on a regional basis the lessons learned from the construction of the pilot projects to build resilient estuary communities that are livable, affordable, economically viable, protected, and desirable places in which to live and work today and well into the future. These communities will not only be better protected during storm events, they will enhance the communities' ability to recover more quickly from future storm events, thereby reducing reliance on taxpayer support. Preserving the natural functions of the State's estuaries will assist in minimizing the vulnerability of those areas that have suffered from repeated flooding. The State, therefore, will focus its resiliency efforts on estuary communities in the nine MID counties through a comprehensive planning process that incorporates multi-disciplinary expertise and develops a framework for resiliency planning that can be applied in estuary communities throughout the State.

New Jersey is ready to participate in this competition and looks forward to working with HUD and the many stakeholders to develop pilot projects that will provide effective and adaptable plans to the most impacted and distressed communities in the nine counties that were most impacted by Superstorm Sandy.

Exhibit B – Threshold Requirements

1. General Description of Project

Although New Jersey has made substantial strides in recovering from Superstorm Sandy -- the most costly disaster in its history -- unmet recovery needs far exceed available resources. In this application, the State proposes to develop pilot projects that address the greatest threat to New Jersey and especially to communities in New Jersey's Most Impacted and Distressed (MID) counties: the risk of flooding. If selected to participate in Phase 2 of this competition, New Jersey will develop an innovative, adaptable resiliency design of layered flood risk reduction measures to reduce flood risk to the State's estuarine communities, while ensuring that estuaries continue to function naturally.

To implement this plan, the State will consider pilot projects within the nine HUD-declared MID counties with unmet needs. The selected project(s) will be designed to be replicable in other estuarine communities with metrics to gauge success. Pilot projects may also enhance investments already made by the State and through existing HUD CDBG-DR funds. Pilot projects will also identify pioneering solutions that provide alternatives to customary flood protection measures and seek to allow communities to co-exist with the estuaries and wetlands in which they are located.

2. Eligible Applicant, Eligible Counties & Eligible Activities

The State of New Jersey is an eligible applicant. The communities that the State will consider for a pilot project will be located in the nine counties identified by HUD as most impacted and distressed (Atlantic, Bergen, Cape May, Essex, Hudson, Middlesex, Monmouth, Ocean and Union). Although a small subset of the communities in need will

participate in the pilot project, many communities in MID counties can potentially implement, or at least incorporate lessons learned from, the design concepts developed in pilot projects. The proposed activities are eligible activities under HUD's *Guide to National Objectives and Eligible Activities for State CDBG Programs* (Chapter 2) (https://portal.hud.gov/hudportal/documents/huddoc?id=DOC_16361.pdf).

3. Most Impacted and Distressed

President Obama's October 30, 2012 disaster declaration following Superstorm Sandy designated all 21 New Jersey counties major disaster areas, but storm damage was particularly concentrated in communities bordering or near the Atlantic Ocean or the Hudson River. The nine counties named above qualify as MID counties because of the extent of the damage they sustained as a result of Superstorm Sandy.

4. Unmet Recovery Needs

The State of New Jersey suffered tens of billions of dollars in damage from Sandy and still has more than $17 billion in unmet needs from that disaster. Sandy caused an estimated $3.7 billion in damages to New Jersey's infrastructure, along with a resiliency need of approximately $16.4 billion for a total of $20.1 billion. After factoring in available federal resources, the State is left with unmet needs of approximately $17.3 billion for the repair and resiliency of New Jersey's energy, water and wastewater, transportation, community facilities, and flood hazards infrastructure.

To illustrate the extent of the damage, New Jersey's wastewater and drinking water infrastructure suffered an estimated $2.6 billion in damages due to Sandy. Nearly 100 wastewater treatment plants, serving some 3.5 million people, suffered damage. Repairs have been made but unmet needs continue to exist. As summarized below, in

the nine HUD-declared MID counties, the FEMA Project Worksheets (PWs) for projects in Categories D and F show 258 projects, with eligible amounts totaling nearly $428 million and an unmet need of almost $42.8 million.

FEMA Categories D & F					
Number of PWs (D+F) By County				FEMA Obligated Values	
County	Category D	Category F	Total PWs	D&F FEMA Obligated	Unmet Need
Atlantic	0	14	**14**	$ 586,643.46	$ 58,664.35
Bergen	2	22	**24**	$ 2,425,218.18	$ 242,521.82
Cape May	9	7	**16**	$ 1,408,844.41	$ 140,884.44
Essex	0	5	**5**	$ 394,837.58	$ 39,483.76
Hudson	2	26	**28**	$ 10,185,867.68	$ 1,018,586.77
Middlesex	0	25	**25**	$ 19,720,721.79	$ 1,972,072.18
Monmouth	5	61	**66**	$ 38,426,017.82	$ 3,842,601.78
Ocean	1	49	**50**	$ 23,352,729.18	$ 2,335,272.92
Union	0	8	**8**	$ 836,041.39	$ 83,604.14
Statewide, incl. Passaic Valley Sewerage Commission	2	20	**22**	$ 330,217,203.48	$ 33,021,720.35
Totals	21	237	**258**	**$ 427,554,124.97**	**$ 42,755,412.50**

For example, the Kearney Municipal Utilities Authority and the North Hudson Sewerage Authority in Hudson County, along with the Atlantic County Utilities Authority, together have $400,000 in unmet needs due to damage to their systems from Sandy. These examples are typical of New Jersey's unmet infrastructure need. Although the State has set aside $225 million of CDBG-DR funds for a non-federal cost share program, these funds do not address the cost share associated with these FEMA Public Assistance projects. These facilities were insured, but exclusion for flooding coverage and a cap limitation renders the match requirement an unmet need.

Unmet housing recovery and resiliency needs in New Jersey also remain considerable in Sandy's aftermath. Although more than 5,000 homeowners already have received financial support from the State to elevate their homes, many others have not, leaving them at risk of serious damage from flooding and potential sea level rise. According to FEMA, more than 33,000 residential structures that were not in the floodplain under the prior FEMA flood maps now find themselves in the floodplain according to flood maps prepared post-Sandy. Without financial support, many of these homeowners may not be able to elevate, which will result in continued flood risk and escalating flood insurance costs.

The FEMA Hazard Mitigation Grant Program (HMGP) which provided funds to applicants that did not participate in RREM, had 1,707 applicants that demonstrated an average elevation cost of $87,800 for a total of $150 million. The maximum grant award is $30,000 per homeowner and many homeowners have received, or will receive, an additional $30,000 through their flood insurance for increased cost of compliance. The program estimates that the unmet need that will have to be covered by homeowners out of pocket is $27,800 on average per homeowner.

Based on these estimates, the total unmet need for homeowners whose projects were determined eligible and submitted to FEMA is $47 million. The true unmet need is much greater because many people were not eligible, for various reasons, to participate in the HMGP program. Therefore, this pool of ineligible homeowners could not elevate their homes and as a result their project was not submitted to FEMA for approval.

Sandy's impact on the State's rental housing stock is also well documented. Sandy not only damaged or destroyed rental units, it also displaced many homeowners

who have had to turn to the rental market. This increased demand resulted in substantially increased rents in some areas, as confirmed by HUD's recently released Fair Market Rent tables. Taken together, the loss of units, low vacancy rates and increased costs created particular hardships for low- to moderate-income and special needs populations seeking affordable rental housing. The State recently identified insufficient resources in the Fund for Restoration of Large Multi-family Housing at $165 million, and in the Special Needs Program at $4 million.

Targeted buyouts of homes in storm damaged and repetitive flood loss areas are a critical recovery priority for the State. The State's buyout program, which seeks to purchase and demolish approximately 1,300 homes, faces unmet needs in excess of $130 million.

The State's commercial fishing industry also suffered significant damage from Sandy. The National Marine Fisheries Service and their team of economists and social scientists estimated a loss for the State's fishing industries from Sandy at $120 million. The Fisheries Disaster Grant Program solicited applications from commercial fisherpersons and received requests for $35 million. The grant program only has $2 million available, leaving an unmet need of more than $33 million.

There is an unmet resiliency need in the Meadowlands District located in Hudson and Bergen Counties. The District is a large but fragile expanse of waterways, marshes, and meadows that are home to a wide variety of wildlife including several threatened or endangered species. A majority of the District is located in special flood hazard areas and is subject to repetitive flooding. Sandy highlighted the flood risk in this region when stormwater breached tide gates, berms, and levees in the Meadowlands area, devastating

Moonachie, Little Ferry, and other low-lying towns along the Hackensack River, and dispersing contaminants.

The New Meadowlands Rebuild by Design project concept is an example of an innovative solution seeking to address needs of housing, businesses, infrastructure and the environment in flood-prone communities. The project concept targets flood risk reduction measures in densely populated communities where the U.S. Army Corps of Engineers (USACE) does not have implementable solutions identified. Yet the unmet need for implementation is substantial. For the northern pilot project alone, the proposal team estimated costs at $570 million – $400 million of which would be used for the initial phases, including construction. In connection with the RBD competition, HUD awarded the State $150 million, leaving an unmet need of $250 million to protect the recovery investment and provide resiliency. While the project may be scaled back following the project feasibility and design phases, it is still likely to have an unmet need approaching $100 million in order to ensure meaningful flood protection.

Along the coast, Sandy's storm surge severely inundated many communities along back-bay watersheds, resulting in extensive damage and destruction to the environment as well as to homes, businesses, and infrastructure. Although DEP and the USACE are implementing critical beach and dune projects along the coastline, these projects do not address flooding in the back-bay areas. As set forth in university studies prepared for DEP, these communities continue to be at risk from flooding due to their location and physical setting. (http://www.nj.gov/dep/docs/flood/final-studies/stevens-barnegat/stevens-barnegat-bay-flood-mitigation-

study.pdf; http://www.nj.gov/dep/docs/flood/final-studies/rutgers-barnegat/barnegat-bay-study-area-flood-mitigation-final-report.pdf).

5. National Objective, Overall Benefit & Tie Back

The State anticipates that the pilot project(s) will meet at least one of the three national objectives required of HUD CDBG funding: elimination of slum and blight, benefit to low-and-moderate income (LMI) persons, and/or urgent need. The State will prioritize activities that benefit the LMI population, with the stated goal of achieving 50% of the awarded funds to benefit LMI persons. The nine MID counties contain varying levels of average income with several identified LMI areas. The pilot project areas and focus of activities will be on LMI communities within the nine MID counties. The State's proposed plan ties back to Superstorm Sandy, because the activities will occur in the nine counties that were considered by HUD to be most impacted and distressed, and will help communities at risk continue to make progress on their recovery and meet the resiliency challenges to make their communities stronger and safer in the future.

Exhibit C – Capacity

1. General Management Capacity

The New Jersey Department of Environmental Protection (DEP) will implement the proposed National Disaster Resilience Competition (NDRC) activities. DEP, administered by a cabinet-level commissioner, is the principal State department responsible for the protection of New Jersey's environment, and the State's natural and historic resources. DEP manages some $1.3 billion in resources annually, when factoring in all federal funds, dedicated monies, special revenues and bond funds.

DEP's Office of Flood Hazard and Risk Reduction Measures (FHRRM), which was established in 2013 and is responsible for managing coastal and riverine flood hazard risks, will be the lead for implementing the grant award. FHRRM possesses and has direct access to project management, quality assurance, financial and procurement and internal control capacity for projects.

Prior to Superstorm Sandy, DEP annually managed an average of $35 million in projects with the U.S. Army Corps of Engineers (USACE). Over the past 2½ years, DEP has also been working closely with USACE to manage $1.3 billion in shore protection projects funded under the Disaster Relief Appropriations Act of 2013. DEP has decades of experience designing and implementing shore protection, flood control, storm risk management and ecosystem restoration projects.

To ensure that all funds are expended in full accordance with the law and proper procedures, DEP obtains internal control and procurement assistance from the Office of the Attorney General, the Department of Treasury Division of Purchase and Property, and the Office of the State Comptroller.

DEP's FHRRM prepared this application and drew upon expertise from within the department as well as from other State Government partners, including the Governor's Office of Recovery and Rebuilding (GORR) and the Department of Community Affairs (DCA), and the Office of Emergency Management.

2. Cross-Disciplinary Technical Capacity

DEP will leverage the full strength and expertise from relevant subject matter experts within the 2,800 employee department, who will provide guidance and technical input for this project. DEP's Office of Science ensures that decision-making is based upon the best available scientific and technical information. DEP's Office of Economic Analysis provides economic and cost-benefit analysis information for departmental projects. The New Jersey Environmental Infrastructure Trust has expertise in financing large infrastructure projects. DEP's Office of Sustainability and Green Energy (SAGE) provides capabilities related to the potential effects of climate change and sea level rise. The Green Acres Program will provide its planning expertise to FHRRM to include open space acquisitions within flood prone areas that support the enhancement of estuaries.

DEP also brings full cross-disciplinary capacity through its engagement with partner agencies, including DCA and GORR. DEP will continue the partnership it established with DCA to implement the disbursement of Sandy CDBG-DR funds. DCA experience in the areas of housing assistance, community planning and development, administration of the Fair Housing Act, and local government management and finance, as well as its experience as the CDBG-DR Grantee for Sandy recovery initiatives, will be a major benefit to this project. DCA also possesses expertise in local zoning and building construction codes.

The New Jersey Housing and Mortgage Finance Agency (NJHMFA) will also be an important partner due to its expertise in the development of affordable housing and rental assistance programs.

Advice and counsel on the post-disaster business recovery and resiliency needs is available from the New Jersey Economic Development Authority (EDA) and regional chambers of commerce in the MID areas. As part of the CDBG Disaster Recovery Action Plan, EDA currently administers $300 million to assist Sandy-impacted businesses and communities.

The New Jersey Department of Transportation (NJDOT) will provide technical expertise related to transportation infrastructure that may be affected by projects. The New Jersey Board of Public Utilities will provide technical expertise concerning building resiliency in the energy sector of the MID counties.

Although it does not expect to do so, if a new multi-entity organization is necessary to carry out the pilot projects under Phase 2, the State has demonstrated the ability to create such an organization.

3. **Partners**

DEP's many partners -- those listed above along with numerous local and county governments, leading national universities such as Princeton University, Stevens Institute of Technology, and Rutgers University, and many non-governmental organizations, including numerous environmental advocacy groups such as New Jersey Future (a nonprofit organization that focuses on land-use policies), will be an integral part of the development and implementation of the pilot projects in Phase 2.

4. Multi-disciplinary Work

Environmental issues are rarely confined to a single media and often have widespread impacts. As a result, DEP has considerable experience working across disciplines to achieve project goals. Examples include DEP projects with USACE, water quality management planning maps (see below), natural resource damage restoration projects, remediation of hazardous substances, and projects involving the coordination of multiple land use permits.

5. **Area-wide Comprehensive Planning**

An example of area-wide comprehensive DEP planning is the water quality planning and amendment process that involved stakeholders from county and municipal governments, EPA, property owners, environmental groups, water utilities and operators of wastewater treatment plants. (www.nj.gov/dep/wqmp/wqmps.html) This process was aided by DEP Bureau of Geographic Information Systems (GIS), which provides desktop tools and mapping applications to DEP employees.

6. **Capacity to Implement Major Projects**

DEP, along with other state agencies, are experienced in implementing large projects constructed with community engagement. For example, following the ocean breach of the barrier island at Mantoloking during Sandy, DEP's Office of Engineering and Construction, in coordination with NJDOT, received funding from the Federal Highway Administration to design and construct a four-mile steel sheet wall. The project was completed in nine months, on time and on budget. DEP is also currently managing $380 million for two Rebuild by Design (RBD) HUD-awarded flood control projects.

7. **Science-based Decision Making**

DEP has numerous resources on which to rely as it assesses existing and potential future risks. DEP's SAGE office, along with the Office of Science and the Office of Dam Safety (in its

role as New Jersey Flood Insurance Program Administrator) provide in-house expertise. DEP also works closely with the Princeton University Cooperative Institute for Climate Science and the Rutgers Climate Institute to provide research on these risks. As required by HUD, DEP will also make use of such tools as NOAA's Sea Level Rise Viewer to predict expected increases in sea level in estuarine communities.

8. **Civil Rights and Fair Housing**

DEP's partners have decades of experience ensuring full compliance with all civil rights and fair housing laws and regulations. The Office of the Attorney General, Division on Civil Rights, enforces the New Jersey Law Against Discrimination, while DCA facilitates the administration of the Fair Housing Act.

9. **Design Quality**

Design excellence and quality of the proposed activities will be ensured through the State procurement laws and regulations, as well as through third-party review of each phase of any project. DEP has extensive in-house experience in ensuring design quality.

10. **Ability to Maintain Capacity**

Per Executive Order No. 140, the FHRRM has the power pursuant to executive order to "…call upon any department, office, division, or agency of this State for information or assistance as deemed necessary to discharge the duties of the Office." Each State department, office, division, or agency is required to cooperate with the FHRRM and to provide such assistance as is necessary and has always been willing and able to do so.

11. **Cost Reasonableness**

Through the State procurement process, administered by the New Jersey Department of Treasury, DEP will have opportunity to solicit bids from qualified contractors and evaluate them

to determine best value. DEP is well-versed with the use of cost-benefits analysis from federally-funded USACE projects. DEP is also experienced with FEMA's cost-benefit analysis through the Hazard Grant Mitigation Program. DEP also has full access to integrity monitors and the Office of State Comptroller as referenced above. Furthermore, DEP can leverage the experience of various state agencies, including DCA, that have extensive experience evaluating cost reasonableness in the context of CDBG-DR funded projects.

12. Community Engagement Capacity

DEP has decades of experience engaging with a wide variety of stakeholders to explore or implement policy decisions. DEP regularly coordinates "stakeholder" meetings to gather comments and address questions from invited representatives of constituencies on numerous priority issues. DEP regularly conducts public hearings and provides responses to public comments on administrative rules and policy decisions, maintains email LISTSERVs that enable the public to obtain information proposals electronically, as well as a web-based portal for electronic submission of comments.

13. **Community Outreach and Consensus Building**

As stated above at #12, DEP has many years of experience reaching out to communities and building consensus. In addition, DEP's Office of Local Government Assistance, Environmental Justice Program, and Office of Communications have proven track records of success in these important areas. In partnership with DCA, DEP also provides assistance to people with Limited English Proficiency by providing interpreters and document translation from English to Spanish, or the predominant language of a community.

Since the creation of DEP in 1970, DEP has worked on countless initiatives and projects that have demonstrated its ability to harmonize its policies with the views of diverse groups.

14. Regional/Multi-Government Capacity

There are numerous examples of DEP's experience in devising regional solutions to environmental issues. One recent example is the Barnegat Bay Comprehensive Action Plan (http://www.nj.gov/dep/barnegatbay/). DEP engaged local and community stakeholders to develop and implement a comprehensive action plan to address the ecological health of this significant State watershed. Another is the RBD Executive Steering Committees and project governance structure, which DEP established to provide high level direction and guidance to the various regional, county, and local agencies working on the RBD projects. The Committees consist of DEP's commissioner, the mayors of relevant municipalities, representatives from HUD, and other senior leaders of interested organizations with which we are partnering in this effort.

DEP regularly works with organizations such as the New Jersey League of Municipalities, the New Jersey Conference of Mayors and the Association of Planning Boards and Zoning Boards of Adjustment. These partners help disseminate information from the proposed activities and projects undertaken so that they can be replicated throughout the State in the future. DEP will also rely on its extensive staffing resources and network of partners to create regional solutions that eliminate or mitigate potential negative local impacts.
In short, the State of New Jersey is a multi-disciplinary organization that has the capacity to carry out a proposed project under the NDRC.

Exhibit D - Need/Extent of the Problem

As required by HUD's Notice of Funding Availability (NOFA), the Unmet Recovery Need and Most Impacted and Distressed (MID) Thresholds criteria, which are also relevant to this Section, are set forth in Exhibit G. As stated throughout this Application, the State's focus in NDRC is to address flood hazard risks in estuarine communities through community-wide, layered flood hazard risk reduction measures project(s) within the nine MID counties.

New Jersey's estuarine communities are particularly vulnerable to coastal and riverine flooding, both from high frequency/low intensity events (such as lunar tides and rainfall) and low frequency/high intensity events (such as hurricanes, tropical storms, and nor'easters). The risks in these communities are increased by high population densities and the high vulnerability of segments of these populations (lower income and the elderly) to storm-related worries at their residences and businesses.

Sandy exposed significant vulnerabilities of New Jersey estuarine communities in the MIDs to flood hazard risks. More than 40,500 primary residences and more than 15,000 rental units sustained "major" or "severe" damage as defined by HUD. Following Sandy, 76% of all NFIP holders made a claim, resulting in 187,065 claims for more than $5.3 billion in losses, again primarily arising from claims within the MID counties. The electrical grid was down throughout the MID counties, in some areas for more than a week. Impacts on government assets and critical infrastructure, including water and wastewater utilities, were considerable.

To date, more than $1.7 billion in FEMA Public Assistance has been obligated to State projects for Sandy recovery -- primarily projects within the MID counties -- easily the largest FEMA Public Assistance amount ever disbursed for a disaster in New Jersey. These are a few of

numerous examples of how flooding and storm surge caused extensive damage concentrated within the MID counties.

Moreover, each MID has area(s) within the Special Flood Hazard Areas (SFHA) that are vulnerable to flooding. Five of the nine counties have greater than 10% of their population in the SFHA. As of October 2013, there are approximately 245,800 current policies under the National Flood Insurance Program (NFIP) throughout the MIDs. Of those policies, a total of 16,017 are considered Repetitive loss (RL) and 2,097 are considered Severe Repetitive Loss (SRL).

Beyond the impacts of the qualifying disaster event, New Jersey has also identified numerous post-disaster threats, hazards and vulnerabilities. For New Jersey, flood risk in the MID counties is an obvious focus of this Application based on past flooding experiences, Sandy damage, and current and future risks of severe weather events and sea level rise. Some critical considerations, as identified in the State of New Jersey 2014 Hazard Mitigation Plan and other sources as identified below include the following:

- Flood events have been increasing. NOAA's National Climatic Data Center (NCDC) storm events database reported that between 1950 and 2009, New Jersey experienced an average of 20 flood events a year. Between January 1, 2010, and December 31, 2012, the average jumped, to more than 135 a year. The State has experienced 15 federally declared disasters over the last fifteen years, with nine of those events impacting at least some of the MID counties. From 2010-2012, the three declared events impacted all nine of MID counties;
- A Rutgers University study in 2013 indicated that sea levels along the New Jersey coastline are rising faster than the global average.
- Each of the MID counties has areas within the SFHA that are vulnerable to the impacts of flooding.

- Approximately 35% of New Jersey is located within the 100-year flood plain. Communities along the State's 127-mile coast are more vulnerable to the damaging impacts of major storms, although flooding from rivers and back bays also presents considerable risk.
- NFIP has recently updated New Jersey's flood risk maps expanding the flood zones to capture more than 33,000 new properties. This demonstrates that New Jersey's risk to flooding events and sea level rise is significant and expanding.
- The FEMA classification of SRL and RL properties increased significantly as a result of the 2011 inland flooding effects of Hurricane Irene and the coastal flooding of Sandy. An increase of 596 SRL properties and 4,376 RL properties occurred after the events, highlighting the continued vulnerability of these properties to repeated flooding in the current environment.

The best available data to support that climate change may further compound the threat of flooding has been developed by the New Jersey Climate Change Adaptation Alliance, a network facilitated by Rutgers University (Alliance). The Alliance has reported that New Jersey has observed an increase in average annual temperatures of 1.2 degrees between the period of 1971-2000 and the most recent decade of 2001-2010. It projects that by the 2020s the average annual temperature in New Jersey could increase by 1.5^{o} to 3^{o} Fahrenheit above the statewide baseline (1971 to 2000). In addition, the Sustainable Jersey Climate Change Adaptation Task Force 2013 has projected that by 2050, the temperature is expected to increase another 3^{o} to 5^{o} Fahrenheit. The study has linked climate change to significant flood risks, most notably sea level rise and future severe weather events.

Although the State did not assist in preparing these reports, their conclusions speak directly to the type of present and future risks identified in the NOFA. The science around

climate change is complex. Therefore, we know that there remain many unknown factors that could affect these projections as more data and experience adds to our knowledge base.

Increased flooding will put at risk ever greater numbers of households, businesses and communities in the MID counties and across the State. New Jersey is the most densely populated state in the country (more than 14 times the national average) and the eleventh most populous, with 60 percent of New Jersey's population living on or near the coast (i.e., primarily within the MID counties). Flooding therefore presents a significant and immediate threat to life, safety and welfare to numerous residents. Communities at risk to flooding events also can be considered less stable and thus less attractive locations for businesses. This creates challenges for attracting and retaining businesses that create jobs.

Increased flood risk also increases insurance premiums – particularly with the forthcoming transition to more actuarially-based NFIP premiums – potentially decreasing home values. This especially challenges LMI households, some of which may find it unaffordable to remain in their current communities due to frequent flood damage repair and insurance costs. The State has developed extensive demographic analyses, including income information, for communities in the MID counties significantly damaged during Sandy (see http://www.renewjerseystronger.org/). All of these impacts taken together can destabilize the ratable bases of communities and place upward pressure on taxes.

Of course, not all properties carry flood insurance. The number of uninsured or under-insured properties in the MID counties is difficult to determine. Flood insurance information is maintained by NFIP, which the State does not regulate or control. Nevertheless, Sandy recovery clearly has demonstrated that the number of uninsured and under-insured households and businesses in the New Jersey are substantial. With billions of dollars in unmet recovery needs

across the housing, economic and infrastructure sectors (i.e., needs after accounting for other recovery resources like private insurance), it is clear that substantial numbers of property owners do not carry sufficient insurance. After all, funding to address "unmet needs" would not be necessary if insurance covered the full extent of the loss.

Additionally, during the course of Sandy recovery the State identified hundreds of households that were rendered ineligible for federal funds because of the so-called "one-bite rule" (also known as the obtain/maintain flood insurance requirement). The State does not know how many households decided not to apply for federal recovery assistance because they knew the one-bite rule made them ineligible. It is difficult to gauge the full impact of the one-bite rule on New Jersey's Sandy recovery efforts, but it is fair to estimate that the impact was meaningful.

The more challenging effect of the one-bite rule is its future impact on New Jerseyans who received federal disaster assistance following Sandy or a prior qualifying disaster event. The federal Biggert-Waters Flood Insurance Reform Act of 2012 will significantly increase the cost of flood insurance premiums in New Jersey. Increased costs will create economic challenges for many homeowners, and likely will have a disproportionate effect on LMI homeowners who may well find themselves unable to afford to continue to reside in their current communities. Higher insurance premiums will also challenge New Jersey homeowners who are required to elevate their homes but do not have funding to do so. Even households that have funding to elevate their homes may choose not to do so because elevations can create accessibility challenges for seniors as well as disabled individuals. Community-wide flood risk reduction measures could change FEMA flood zones, or at least impact how NFIP sets premiums, therefore mitigating these challenges.

Based on all of these vulnerabilities, as well as additional neighborhood-specific vulnerabilities which could include the location of polluted sites (such as brownfields or Superfund sites), community-wide flood hazard mitigation is critical to protecting New Jersey's LMI population as well as other vulnerable populations.

In addition to the direct benefits households would realize from community-wide flood hazard risk reduction measures, communities less at risk to flooding events also are more stable and thus more attractive locations for business enterprises, which correlates to attracting and retaining jobs. Less risk also stabilizes the ratable bases of communities, placing downward pressure on taxes and better ensuring that essential public services can be provided to residents. Other benefits include infrastructure repair savings, reduction in the need for emergency services, less sewer backups, and fewer negative environmental impacts. Clearly, community-wide flood risk protection measures can maintain the fabric of communities, and protect the quality of life for New Jerseyans and business interests, especially in LMI flood risk areas.

In developing the projects in Phase 2, the State will follow the comprehensive risk analysis and science-based risk approach described in the "Comprehensive Risk Analysis Framework for the Protection of Potential Risk Reduction Measures" described in Amendment No. 7 to New Jersey's CDBG-DR Action Plan. However, unless HUD requires otherwise, this analysis would not extend to submitting the New Meadowlands Project for consideration in Phase 2 because a comprehensive risk analysis and science-based risk approach already was undertaken for the conceptual design approved by HUD, so that work will not be re-done.

Exhibit E - Soundness of Approach

1. Consultation to Date

Consultation and stakeholder involvement have been essential components of the State's recovery from Superstorm Sandy. The State has sought and incorporated input from various sources and taken advantage of available resources. Soliciting public and stakeholder input ensures different perspectives and improves the decision-making process.

During the recovery process, members of the public have repeatedly articulated their desire for more and better flood mitigation measures, particularly for green infrastructure. At each CDBG-DR public hearing, during public comment periods, and through other forums, citizens and stakeholders have raised the need to address past flood damages and mitigate future flood risk. As awareness grows of potential sea level rise and other threats of future flooding, demand to acknowledge and plan for the increased risk of flooding will also expand.

A variety of specific concerns about the cumulative impacts of risks and vulnerabilities of flooding have been articulated, including: the risk from wave energy, risk of continued flooding and a lack of flood protection, storm surges flushing and dispersing contaminants to a larger area, diminishment of water quality, mold risk as a result of flooding, disease vectoring from sewage upwelling, economic disruption through business closures and the need for businesses to reopen promptly, road closures, home value depreciation, and the inability of residents to commute to their places of employment. Other concerns include the loss of the characteristics of a community or neighborhood due to its inability to recovery quickly from storm-related events.

Indirect risks and vulnerabilities were also considered. Stakeholders expressed concerns about potential job loss, risk to public works/infrastructure in the floodplain and sewage discharges into estuaries. Additionally, in implementing flood mitigation and resilience measures site remediation issues need to be considered to ensure the areas of concern are not impacted.

To address such concerns, the State sought expert advice on the best ways to mitigate flood hazards. The State engaged with various state universities with expertise in this area to study flooding risks across the State and make recommendations for mitigating those risks. Each of the universities undertook thorough research and analyses and produced a comprehensive written report describing the risks and hazards associated with flooding and making recommendations for mitigating them. These written reports are all available at http://www.nj.gov/dep/docs/flood/index.html.

The State also has sought input on flood risk reduction and mitigation efforts from stakeholder groups. Section 5 of Action Plan Amendment No. 7 lists some of the stakeholder groups that DEP engaged to discuss, among other things, flood risk and mitigation strategies. And as referenced above, considerable input has been provided by residents, including during the public comment periods to Action Plan Amendments. The various impacts of flooding -- insurance costs; repairs; etc. -- and need for mitigation are referenced through the public comments and state responses section of Action Plan Amendment No. 7.

Apart from general outreach regarding flood hazard risk reduction measures, DEP also has commenced outreach specific to the NDRC funding opportunity. DEP already has held outreach meetings in northern New Jersey (Bergen County) and southern New Jersey (Atlantic County) specific to the NDRC funding opportunity to discuss the concept of flood hazard risk reduction measures and potential mitigation strategies for estuarine communities. Meetings were attended by residents, county and local government officials, non-government organizations (NGO) and academia. At the meetings, DEP presented data concerning the impacts of flooding and maps depicting structures at risk from sea level rise and solicited input on remaining recovery needs and flood protection approaches. In addition to these two meetings, DEP has held various calls with interested parties regarding the NDRC funding opportunity.

Additionally, DEP contacted the county planning departments in the nine MID areas, three regional estuary programs, academic institutions, and multi-regional agencies with jurisdiction in those areas. Among other things, experts at Rutgers University assembled and analyzed data pertaining to the impacts of flooding and the vulnerabilities and other characteristics of the MID areas. DEP also consulted with environmental justice communities through existing relationships regarding flood hazard risk reduction measures.

Finally, DEP will post its application (in English and Spanish) on its official website to afford citizens, local governments, and other interested parties an opportunity to examine its contents. DEP will make the application available for a period of no less than fourteen days prior to its submission to HUD and will encourage public comment. To increase public awareness, DEP will notify the public and key stakeholders that the application is available for review and comment through electronic mailings, press releases, statements by public officials, media advertisements, public service announcements, and/or contacts with community-based organizations. Moreover, DEP already has scheduled two formal public hearings on its proposed Phase 1 application, to be held on the following dates and the following locations:

- Tuesday, February 24, 2015 (4:00-7:00 pm); Little Ferry Borough Hall, 215 Liberty Street, Little Ferry, NJ 07643
- Wednesday, February 25, 2015 (4:00-7:00 pm), Atlantic City, City Hall, 2nd floor, 1301 Bacharach Boulevard, Atlantic City, NJ 08401

DEP also will be accepting written comments, and all comments will receive equal treatment regardless of the method of submission.

2. <u>Future Consultation</u>

DEP recognizes that ongoing public collaboration is a critical component of developing and realizing large public projects, such as the community-wide flood hazard risk reduction

measures concept DEP is putting forth in this Phase 1 Application. To that end, if New Jersey moves to Phase 2 of the NDRC, and identifies specific project and pilot project areas for implementation, DEP will comply with all citizen participation plan requirements (including the requirements in FR-5696-N-11). In order to provide all New Jersey citizens with an opportunity to participate in the planning, implementation, and assessment of the projects described in this application, the DEP will follow the Citizen Participation Plan applicable to CDBG-DR Sandy recovery programs (http://www.nj.gov/dca/announcements/pdf/CITIZEN_PARTICIPATION_PLAN_3-13-13.pdf), as well as the one specific to the Rebuild by Design ("RBD") project (http://www.renewjerseystronger.org/wp-content/uploads/2014/12/APA-12-English-RBD-Amendment_FINAL.pdf).

To realize citizen participation requirements, DEP plans to adopt the same approach in use for the RBD projects. DEP has set up a project governance structure led by an Executive Steering Committee, which is chaired by the DEP Commissioner and has members including local mayors and leadership from other critical project stakeholders. This Committee advises DEP on the direction of the project, policy issues that arise in connection with the projects, and other issues. The Project Management Team (PMT) and the Project Development Team (PDT) will work together on the day-to-day issues that arise in connection with the projects. A number of smaller teams will support the PMT and PDT. This includes a sub-committee focused specifically on outreach and developing and implementing a robust citizen participation plan. Further description of this process is available in CDBG-DR Action Plan Amendment No. 12.

Among other things, the Citizen Participation Plan will direct the engagement of stakeholders and solicitation of input on the proposed project approach through public meetings, conference calls, individual meetings, e-mail communications, and press releases and by posting

information, drafts, plans, etc. on its website. Public notices have been and will continue to be published in Spanish.[1] Public hearings and meetings will be held within the targeted communities during evening hours in handicapped accessible venues. DEP also will work with with various stakeholders, including NGOs, academia and advocacy groups, to obtain additional technical data and facilitate community engagement efforts.

As it has done throughout the recovery process, the State will provide citizens, local officials, and other stakeholders with reasonable and timely access to information and records relating to this application, the projects envisioned herein, and the State's use of CDBG-DR funds. DEP will accept written comments via email, regular mail and through public hearings.

3. Idea or Concept

In New Jersey, floods are frequent and costly natural hazards in terms of human hardship and economic loss, particularly to communities that lie within floodplains and other flood-prone areas. Communities adjacent to water and wetlands were inundated by storm surge from Superstorm Sandy and remain vulnerable to flooding from future weather events and sea level rise. Our Phase 1 project concept is to address those vulnerabilities by building replicable resiliency in estuarine communities through layered flood hazard mitigation measures, with a particular focus on layering green infrastructure protections. The primary focus for implementation of this concept will be on areas that qualify as LMI, have other vulnerable population segments, sustained considerable damage from Sandy, and are at considerable risk of future flood damage.

The model for making estuarine communities more resilient requires using an array of measures that will integrate and enhance natural features such as wetlands and marshes. Pilot

[1] DEP will adopt the same approach to other language translations being followed by DCA and other agencies in connection with CDBG-DR funded Sandy recovery projects.

projects will develop innovative community redesigns that can include elevation of homes (and roadways, as necessary), creation and expansion of wetlands beneath and around homes, redirection of water through the community and away from critical infrastructure, and the use of conventional engineering flood control that is compatible with the environment and multiple community uses (housing, recreation, transportation, public access and economic revitalization). To allow for public access and recreation, biodiversity and green design, the approach considers the distinction between hard versus soft structures, and characteristics of the physical location, residences and businesses affected. The model will reduce flood risks and increase human and ecosystem resilience through a combination of natural, nature-based, nonstructural, and structural measures. Instead of simply repairing structures damaged by the storm, estuarine communities would be reengineered to make them more resilient. Elevations of structures would complement nature-based measures to make the communities more tolerant of flooding. Soft infrastructure such as wetlands would be utilized to reduce the impact of waves – with the co-benefits of creating new recreational spaces and improving water quality. The goal is to convert vulnerable communities into resilient communities living in harmony with natural estuaries.

Implementing these goals will require collaboration; consensus must be built among the State, local governmental entities and residents, among others. DEP must partner with municipalities that support the goals, want to collaborate to refine the model, and have already made (or are considering) changes to their master plans to encourage community redesign concepts.

For large scale public works projects, it is important to maintain a dynamic approach to planning to reflect updated restoration practices and techniques as the project evolves. Science-based planning and community partnering ensures that the project will be feasible and effective at supporting recovery and resilience. In its design concepts, the State will use predictive sea

level modeling tools and their various sea level rise scenarios. Each aspect of the design will improve resilience, allowing the communities to withstand and recover more quickly from future storms and other stress events. Each pilot, in turn, will provide the measurement metrics necessary to fine-tune the concepts and determine the viability of the larger project vision. Moreover, DEP will use the "Comprehensive Risk Analysis Framework for the Selection of Potential Risk Reduction Measures" described in CDBG-DR Action Plan Amendment No. 7 to evaluate potential projects in Phase 2.

DEP has already taken steps to make this vision a reality. To make the State more resilient, DEP already has, among other things: served as the non-federal sponsor for the United States Army Corps of Engineers (USACE) beach replenishment projects ($1.3B) on the entire Atlantic coast; administered the Hazard Mitigation Grant Program (HMGP) focused on home elevations; constructed a 4-mile seawall with Federal Highway Administration funding; partnered with local governments to apply for and use FEMA mitigation funding; used State and Federal funding via the Blue Acres program to buyout homes in flood prone communities; and accepted HUD's award of $380M for the RBD projects and begun implementation of those projects. Therefore, implementation of the project concept at a minimum would be leveraging the State's considerable investment in enhancing flood protection measures as part of rebuilding.

The New Meadowlands RBD project in particular involves an integrated vision of protecting, connecting and growing the Meadowlands District. The project concept emerged from a larger regional analysis that mapped a comprehensive set of risks and vulnerabilities (flood risk, social vulnerability, vital network vulnerability and environmental degradation). The project will protect the developed areas of the Meadowlands District against flooding from storm surges, with an elongated, green infrastructure berm. By integrating transportation, ecology and development, the project aims to transform the Meadowlands to address a wide spectrum of risks

while providing civic amenities and creating opportunities for new redevelopment. Through the NDRC process, the State hopes to refine the RBD design concepts with stakeholder input and augment the RBD with an NDRC award, to improve the viability and scope of the project and increase the resilience of adjacent communities.

Co-Benefits: The co-benefits are considerable. Flooding presents an immediate threat to life, safety welfare. Mitigating that threat, and all ancillary health impacts of flooding, is an incalculable co-benefit to a community flood control project. Additionally, by reducing the flood risk, communities will become more stable and thus more attractive locations for business enterprises (i.e., less risk of physical damage and business interruption). Attracting and retaining more businesses directly correlates to attracting and retaining more jobs. Additionally, community-wide flood protection should provide cost savings to residents, businesses, and government by reducing insurance premiums, and eliminating the need for costly and repetitive recovery projects. It should also increase the value of homes in the area, adding to households' equity. All of this, in turn, stabilizes the ratable bases of communities, placing downward pressure on taxes and better ensuring that essential public services can be provided to residents. Other co-benefits include infrastructure repair savings, reduction in the need for emergency services, less sewer backups, and fewer negative environmental impacts. The State will look for opportunities to leverage these co-benefits toward additional funding. All combined, these co-benefits achieved through the implementation of community-wide flood protection measures can revitalize the economies of entire communities.

Integrated Thinking: As described above, DEP will develop creative, innovative designs by enhancing collaboration between academia, residents, all levels of government and other relevant stakeholders to integrate design that identifies risks and impacts, from not only storm-related events but also adaptation planning, that will guide the most appropriate resiliency strategy. It

will incorporate a comprehensive risk analysis and science-based risk approach consistent with the "Comprehensive Risk Analysis Framework for the Selection of Potential Risk Reduction Measures" set forth in CDBG-DR Action Plan Amendment No. 7.

Residents, Small Businesses and Future Impacts: Residents and small businesses are the most vulnerable to future threats, and the proposed concept recognizes their significance and contributions to a vibrant community. The State will include local and regional business advocacy groups in order to further enhance economic revitalization during the Phase 2 process. The State's project concept targets densely developed estuarine communities that have a history of flooding, with a focus on how flood mitigation and resilience-based projects can protect communities from not only near-term storm-related events but the potential long-term impacts of climate change. In addition, due to risks of sea level rise, estuarine communities are vulnerable to routine inundation and subsequent blight resulting in greater stress on residents and businesses.

Impacts to Adjacent Areas: A critical factor in development of a flood mitigation project in an estuarine area is to preserve the natural flood storage and surge reduction functions of the estuary. Positive impacts on areas adjacent to a project include reducing the risk of flooding by preserving the functions of the estuaries and ecosystems, ultimately restoring or creating wetlands. Surveys conducted by the DEP after Superstorm Sandy showed that communities with natural landscapes or wetlands sustained less damage than those without these features. These features also increase opportunities for tourism through the expansion of recreation, which has a direct economic benefit to residents. Replication of a project or its components into other estuarine communities is an affirmation of the pilot project's positive results. While the goal is to avoid negative impacts on surrounding areas, feedback from community engagement indicates that aesthetics and maintaining the existing character are a concern, and will be a design consideration.

Interdependencies: Successful innovative community redesign is dependent upon addressing transportation, housing, energy, infrastructure (water and wastewater), public safety and environmental needs. These goals and objectives will be further defined with additional stakeholder outreach through Phase 2 of the application.

Jurisdictional Vulnerabilities: Vulnerabilities and unmet recovery needs cannot be resolved within the jurisdiction and will necessitate working with other government units and regional organizations. DEP has initiated consultation and outreach with these entities. Recognition of this has resulted in the initiation of consultation and outreach to other agencies and partnerships, and the initial response for pilot projects in estuarine communities has been positive. As outlined in Exhibit C (Capacity), DEP is still in process of developing partnerships. The DEP will formalize any commitments as necessary during Phase 2. The State will work with its partners to achieve our common goals and will work with any other jurisdictional concerns. The State has a long-standing relationship with local, county and regional planning bodies and will build upon those relationships to develop a project.

Community Resilience Approach: Superstorm Sandy made it apparent that the land use patterns for transportation, community development, and environmental development within the estuarine communities have isolated them to their detriment during crisis situations. Post-Sandy damage assessments revealed that areas subjected to the least amount of impact were located behind natural landscapes, and coastal communities have recognized their current and future vulnerabilities and need for resilience. As required by HUD, DEP will incorporate risks associated with potential climate change and sea level rise by utilizing sea level rise tools to design resiliency enhancements and by enhancing and developing living shorelines, locating vulnerable areas for additional buyouts of homes and elevation of structures, and restoring and maintaining beach replenishment projects. This includes utilizing the NOAA Sea Level Rise

Tool, which already has been incorporated into the State's $50 million Flood Hazard Risk Reduction Measures recovery program, administered by DEP.

Regarding FEMA's Community Ratings System (CRS), CRS can be a valuable program for some New Jersey communities, and the State continues to partner with FEMA to assist interested communities in entering the program and improving their respective CRS scores. That said, for various reasons, some communities have determined that the CRS program is not appropriate for them. In respect of home rule in New Jersey, and understanding that not all programs will benefit all communities, the State continues to respect the discretion of each community in determining whether to pursue CRS participation. However, the State provides technical assistance to those communities interested in participating in CRS, and recognizes the potential tie between CRS benefits and regional or community-wide flood hazard risk reduction projects.

Finally, the State has assessed vulnerabilities statewide and taken steps to plan and adapt for future weather events, by adopting the 2014 State of New Jersey Hazard Mitigation Plan. (http://www.state.nj.us/njoem/programs/mitigation_plan2014.html) Moreover, consistent with the NOFA, the State will provide its proposed Phase 1 application to the Regional Coordination Working Group prior to submission to HUD.

Exhibit F – Leverage and Outcomes

New Jersey's history of flood damage from weather and storm surge events is long and harrowing. Since 1955, there have been 35 Presidentially Disaster Declarations in New Jersey due to the damage caused by severe storms and flooding. New Jersey, therefore, intends to use the funds provided through this competition to design and construct pilot projects in the Most Impacted and Distressed (MID) counties to create a model design for resiliency that will protect estuaries and estuarine communities. The State intends to apply on a regional basis the lessons learned from the construction of the pilot projects to build resilient estuary communities that are livable, affordable, economically viable, protected, and desirable places in which to live and work today and well into the future. These communities will not only be better protected during storm events, they will enhance the communities' ability to recover more quickly from future storm events, thereby reducing reliance on taxpayer support. Preserving the natural functions of the State's estuaries will assist in minimizing the vulnerability of those areas that have suffered from repeated flooding. The State, therefore, will focus its resiliency efforts on estuary communities in the nine MID counties through a comprehensive planning process that incorporates multi-disciplinary expertise and develops a framework for resiliency planning that can be applied in estuary communities throughout the State.

Like the projects selected for funding through HUD's Rebuild by Design (RBD) competition, the State's estuary protection concept includes recovery and resiliency measures designed to support housing and economic growth, protect infrastructure, and enhance natural environmental features in a community. Feasibility studies will evaluate the potential of green and nature-based infrastructure, traditional flood control measures, as well as the potential for increased passive recreational opportunities. Pilot projects that have mechanical flood control

measures would be designed to have a minimum 50-year life span. Soft infrastructure measures would be designed to incorporate sea level rise through 2050. Proposed projects would be designed in an environmentally and financially sustainable way through community engagement and feasibility analyses. Ultimately, selection of the project will rely on a reasonable cost benefit, value engineering and long term maintenance agreements with partners benefitting from the project. State and Federal environmental permitting reviews will assure environmental sustainability.

The pilot projects, both as structural redesign to estuarine communities and as frameworks for master planning, are intended to present communities with a new paradigm that can be replicated, while taking into account local conditions, needs, and preferences.

Recognizing that estuarine communities will have to adapt over time, the pilot projects are intended to accelerate the change and build upon the repair and resiliency initiatives being pursued post-Sandy. Community development and redevelopment plans outside the pilot can be revised to encourage these innovative approaches to coastal living. As estuarine communities revise their master plans, new development will be required to comply with these new standards.

Co-benefits: The co-benefits associated with the resilient communities' projects are considerable. Flooding presents an immediate threat to life, safety welfare. Mitigating that threat, and all ancillary health impacts of flooding, is an incalculable co-benefit to a community flood control project. Additionally, by reducing the flood risk, communities will become more stable and thus more attractive locations for business enterprises (i.e., less risk of physical damage and business interruption). Attracting and retaining more businesses directly correlates to attracting and retaining more jobs. Additionally, community-wide flood protection should provide cost savings to residents, businesses, and government by reducing insurance premiums, and

eliminating the need for costly and repetitive recovery projects. It should also increase the value of homes in the area, adding to households' equity. All of this, in turn, stabilizes the ratable bases of communities, placing downward pressure on taxes and better ensuring that essential public services can be provided to residents. Other co-benefits include infrastructure repair savings, reduction in the need for emergency services, less sewer backups, and fewer negative environmental impacts. The State will look for opportunities to leverage these co-benefits toward additional funding. All combined, these co-benefits achieved through the implementation of community-wide flood protection measures can revitalize the economies of entire communities.

Local and Regional Partners: New Jersey has a long record of maintaining critical environmental infrastructure. DEP has a nearly 45 year history of memoranda of agreements with local governments for maintenance programs, most prominently with the Blue Acres Program and with local shore protection projects along the State's coast. Local and regional partners or resources that could potentially address implementation and maintenance aspects would include the nine MID counties and the U.S. Army Corps of Engineers (USACE). The New Jersey Environmental Infrastructure Trust (EIT), which is in DEP, will be a major partner in this effort, adding decades of expertise and experience in providing more than $4.3 billion in low-cost financing for water infrastructure projects and maintenance since 1986. Additional resources that could help guide the DEP in their design of flood reduction projects include: local government units, county planning agencies, and regional partners such as the Meadowlands Regional Commission and various estuary-based partnerships (e.g. New York-New Jersey Harbor Estuary Program, Barnegat Bay Estuary Program and the Partnership for the Delaware Estuary).

To identify ways in which the proposed approach would address issues and vulnerabilities that might affect risk considerations and insurance premiums for both public and private property owners in the MID counties and beyond, DEP has had discussions with the National Flood Insurance Program (NFIP) program coordinator within DEP's Office of Engineering and Construction regarding the community rating system and its effect on insurance premiums. As part of the State's Phase 2 application, DEP would engage insurers about premium reductions on properties within flood control mitigated areas as potential project areas are further defined. Co-funding from other community stakeholders is an idea that will be explored at greater length once metric data can demonstrate measures of project success.

Co-benefits to leverage financing: Financial contributions can be derived from the environmental, human health and workforce development co-benefits of the flood mitigation projects and their stabilizing effect on communities. DEP has a history of partnering with leading corporations to advance environmental goals, such as the New Jersey Corporate Wetlands Restoration Partnership. Other prospective partners could include the EPA and USACE for wetland restoration and flood protection; healthcare systems disbursing grant monies promoting healthy lifestyles in conjunction with environmental enhancements (bike/walking paths, etc.); corporations that no longer face an unstable workforce population or repetitive losses; and utilities that no longer face overwhelming recovery costs.

Cost savings envisioned as part of the co-benefit approach would be created through workforce development as the projects create innovative new construction techniques and practices that will require trained employees and create new business opportunities. Both the New Jersey Department of Labor and the Economic Development Authority are potential partners in realizing this co-benefit.

Furthermore, repetitive losses in these estuarine communities have taken its toll on business and employees. Experience has demonstrated that more resilient communities both attract and retain business and employees. Investment in flood protection and resilience planning can potentially prevent loss of human life, save on infrastructure repair and emergency services, prevent degradation to drinking water and wastewater facilities, prevent lost wages by employees, reduce or eliminate losses to the tourism sector, and reduce or prevent damages suffered by homeowners and the subsequent reduction of home values. State, county and local entities that are not continuously in recovery mode are able to restore community programs that address the unmet needs of vulnerable populations, such as seniors, after-school care, and job training programs.

Commitments: The State will further explore commitments by all levels of government, the private sector and philanthropic community as project areas are further defined during Phase 2. Regardless of other potential commitments, the State will invest at least $250,000 from DEP's Shore Protection Account to conduct a feasibility analysis of the replicability of a pilot project throughout estuarine communities.

Exhibit G – Regional Coordination and Long-term Commitment

In the aftermath of the widespread destruction caused by Superstorm Sandy, the State of New Jersey, working with federal, county, and local partners, has taken numerous significant steps to increase resilience in those areas of the State at risk from future serious flooding events. Resiliency is, after all, not only about withstanding serious weather events, it is also about the ability to rebound quickly after such events. In just over two years, the State has made substantial progress in rebuilding better and stronger, but more remains to be done.

Within months after Sandy, DEP partnered with the U.S. Army Corps of Engineers (USACE) on its two year North Atlantic Comprehensive Study (NACCS) (www.nad.usace.army.mil/compstudy). This study includes a coastal framework as well as storm suite modeling, coastal GIS analysis, and related evaluations, for the affected coastlines from New Hampshire to Virginia. NACCS identifies existing natural and nature-based features as well as an evaluation of their performance during Sandy and other storm events. DEP believes that the NACCS will lead to the potential identification of resilient flood risk reduction projects throughout the estuarine communities of New Jersey.

In response to Sandy, DEP adopted emergency amendments to its Flood Hazard Area Control Act rules that set minimum elevation standards for the construction and reconstruction of houses and buildings in areas that are in danger of flooding. The amendments, adopted by emergency action on January 24, 2013, require new and reconstructed buildings to be elevated in accordance with the best available flood mapping. This will help protect people and property during future floods. The flood hazard rules require the lowest floor of habitable buildings in flood hazard areas to be constructed at least one foot above the design flood elevation, which is the FEMA 100 year flood elevation.

In June 2013, as part of the State's rule revision process to recover and rebuild resiliently from Sandy, the DEP adopted the new Coastal General Permit #29 to allow for projects that create living shorelines (N.J.A.C. 7:7-7.29). Living shorelines use the strategic placement of native vegetation, sand, organic materials, and/or bivalves such as oysters, clams and mussels to reinforce shorelines and prevent flooding naturally.

Just last month, Governor Christie signed into law legislation requiring the DEP Commissioner to study blue roofs and green roofs as a stormwater management tool. (P.L.2015, c.20).

Metrics

Through DEP's Blue Acres Buyout Program, the State is investing $300 million in federal disaster recovery funds to provide homeowners with the option to sell storm-damaged homes at pre-storm value in flood-prone areas. Buyouts of homes to be converted to open space would move homeowners out of harm's way of severe and repetitive losses and improve ecosystem functions. This resiliency technique benefits homeowners in the MID counties and extend statewide. DEP has initially targeted 1,300 homes. We will measure our success over the next five years against the number of households (statewide) that have been moved out harm's way.

Metric – number of households purchased in flood prone areas post-Sandy

Baseline: 0. Goal: 1,300 homes. Time frame: 5 years.

To increase the resiliency of New Jersey's shore communities, DEP applied for and received grant funding from the National Fish and Wildlife Foundation's Hurricane Sandy Coastal Resiliency Competitive Grant Program. These grants were awarded to projects that assess, restore, enhance or create wetlands, beaches and other natural systems for the purpose of

protecting communities and mitigating the impacts of future storms and naturally occurring events. The three State projects to receive funding were: 1) *Reusing Dredged Material to Restore Salt Marshes and Protect Communities*, which proposes to reuse dredged materials to restore 90 acres of salt marsh for Avalon, Stone Harbor, and Fortescue, New Jersey, thereby providing wildlife habitat and reduce flooding and erosion impacts on nearby communities; 2) *Building Ecological Solutions to Coastal Community Hazards*, which will develop, design, and deliver green infrastructure techniques that add ecological value and enhance community resiliency; and 3) *Enhancing Liberty State Park's Marshes and Upland Habitats*, which proposes to create and improve Liberty State Park's 40 acres of salt marsh and 100 acres of upland habitat in Jersey City, New Jersey to improve ecosystem resiliency and create a new publicly accessible area within the park.

Metric – Number of acres of habitat restored or enhanced.

Baseline: 0. Goal: 230 acres. Time frame: maintain restoration for at least 50 years.

In the summer of 2013, President Obama's Hurricane Sandy Rebuilding Task Force created the Rebuild by Design competition (RBD) to develop ideas to improve physical, ecological and economic resilience in regions affected by Superstorm Sandy. Two projects in New Jersey received funding: one focused in the Hudson River region (allocated $230 million by HUD) and the other in the Meadowlands region (allocated $150 million by HUD). Both project concepts contemplate a combination of nature-based solutions, including the restoration and/or creation of wetlands, along with the implementation of hard structures to block storm surge. DEP will measure (among other things) the number of wetlands restored or constructed in the Meadowlands project to demonstrate additional acres of green infrastructure.

Metric - Number of wetlands acres improved and constructed.

Baseline: 0. Goal: 300. Time frame: 8 years.

As a result of the State's emergency amendments to its Flood Hazard Area Control Act rules, many homes and other structures will be elevated using FEMA's best available data, which will substantially mitigate flood risk. Rebuilding to this higher standard is an important component in enhancing community resiliency. While DEP allowed for "permits by rule" to avoid processing delays and permitting fees, the State can measure the number of households who elevated under the State's housing recovery programs. There are more than 8,000 homeowners participating in the State's primary homeowner recovery programs. Grantees that were substantially damaged are required to elevate. DEP will measure the success of the revised flood hazard rules based on the number of applicants in the State's RREM program that sustained substantial damage and must now elevate to the new standards plus one foot of freeboard.

Metric – Number of homes elevated.

Baseline: 0. Goal: 3,000. Time frame: 5 years.